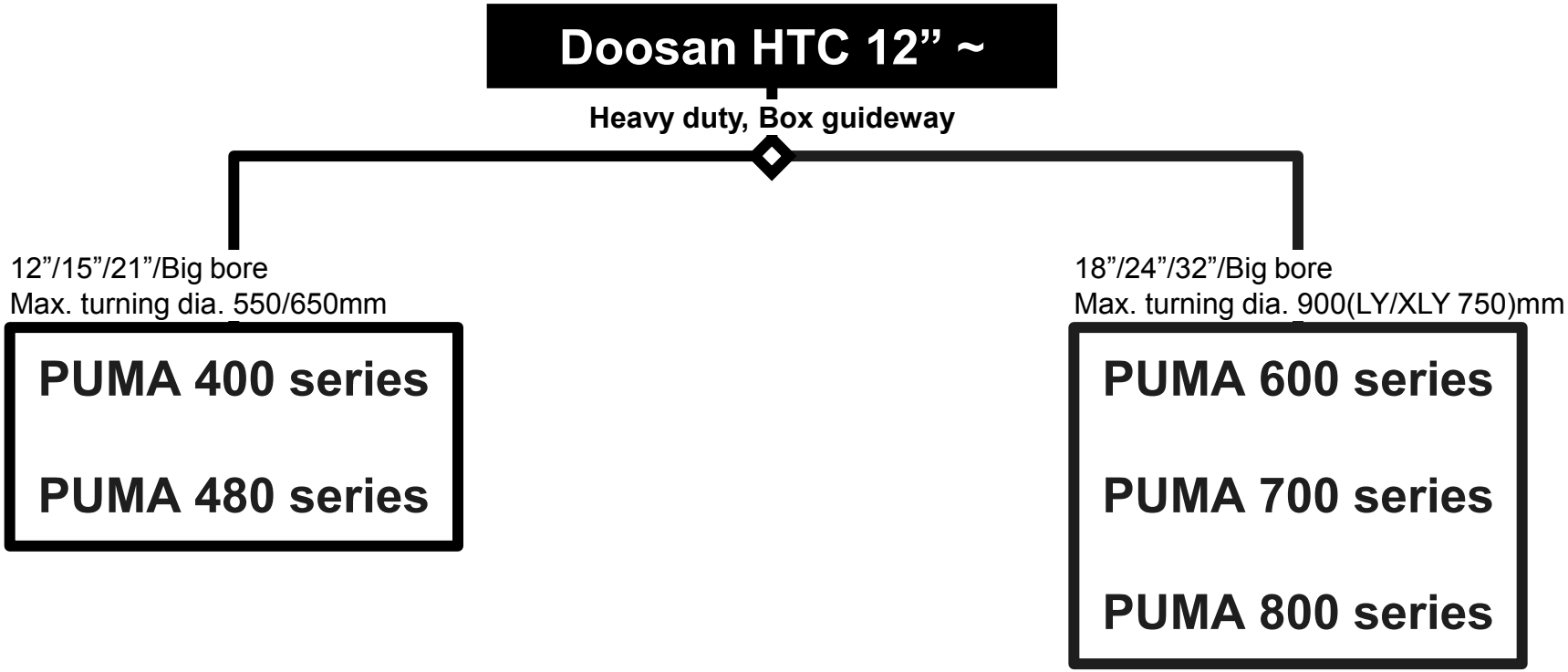
A-1. Horizontal TC

Chuck size (inch)	a			b	c	d		e		f	g
	Small size HTC			Medium size HTC	Large size HTC	Multi-tasking HTC		Twin turret HTC		2spindle HTC	Aluminum Wheel turn HTC
	Lynx series	PUMA GT series	PUMA series			PUMA SMX series	PUMA MX series	PUMA TT series	PUMA TL series	PUMA HT/QL series	PUMA AW series
											
6	Lynx 210 Lynx 220A						MX1600	TT1500		HT230T	
8	Lynx 220B Lynx 220C	GT2100	PUMA 2100				MX2100	TT1800 TT2000	TL2000	H250T QL200H	
10	Lynx 300	GT2100B GT2600	PUMA 2600			SMX2500	MX2600	TT2500	TL2500	H310T QL300H	
12			PUMA 2600B PUMA 3100	PUMA 400A		SMX3100	MX3100				
15				PUMA 400B							
18					PUMA 600						
21				PUMA 400C PUMA 480							
24					PUMA 700						
32					PUMA 800						
Big bore				PUMA 480D (275mm)	PUMA 800B (375mm)						
Wheel dia.											AW560(20") AW660(24")

Medium and Large size HTC

PUMA 400~800 series are suitable for heavy duty machining.
Especially, PUMA 400~800 series provide various applications for Oil & Gas Industry customers.



PUMA 400/480/600/700/800 series

Function

Chuck size

Chuck size (inch)	Bar working dia. (mm)	Max. turning dia. (mm)	Max. turning length (mm): 2ax/M	2 axis X/Z axis	M 2 axis + Milling	Y 2 axis + Milling + Y axis
12	90	550	1079/1014	PUMA 400A	PUMA 400MA	
			2129/2064	PUMA 400LA	PUMA 400LMA	
			3150	PUMA 400XLA	PUMA 400XLMA	
15	117	550	1043/978	PUMA 400B	PUMA 400MB	
			2093/2028	PUMA 400LB	PUMA 400LMB	
			3114	PUMA 400XLB	PUMA 400XLMB	
18	117	900 (LY: 750)	1600	PUMA 600	PUMA 600M	
			3200 (LY: 3250)	PUMA 600L	PUMA 600LM	PUMA 600LY
			5050	PUMA 600XL	PUMA 600XLM	PUMA 600XLY
21	165.5	550	1024/959	PUMA 400C	PUMA 400MC	
			2074/2009	PUMA 400LC	PUMA 400LMC	
			3095	PUMA 400XLC	PUMA 400XLMC	
		650	992/951	PUMA 480	PUMA 480M	
			2042/2001	PUMA 480L	PUMA 480LM	PUMA 5000LY
			3065	PUMA 480XL	PUMA 480XLM	
24	164	900 (LY: 750)	1600	PUMA 700	PUMA 700M	
			3200 (LY: 3250)	PUMA 700L	PUMA 700LM	PUMA 700LY
			5050	PUMA 700XL	PUMA 700XLM	PUMA 700XLY
32	(320)*	900 (LY: 750)	1600	PUMA 800	PUMA 800M	
			3200 (LY: 3250)	PUMA 800L	PUMA 800LM	PUMA 800LY
			5050	PUMA 800XL	PUMA 800XLM	PUMA 800XLY
Big bore	(275)*	650	992	PUMA 480D		
			2042/2001	PUMA 480LD		
			3065	PUMA 480XLD		
Big bore	(375)*	900	1600	PUMA 800B		
			3200	PUMA 800LB		

- **PUMA 400/480 series will be replaced PUMA 4000/5000 series.**
  - **Launching Plan: '14. 05**
  - **Mass Production Plan: '14. 09~**

New

- **Launching Plan: '14. 03**

*: Spindle through hole dia.

PUMA 400 series

Major spec. (P400 C / LC / XLC / /MC / LMC / XLMC)

- Swing over bed / carriage : 770 / 590 mm
- Max. turning dia. : 550 mm
- Max. turning length
  - 1024 / 2074 / 3095 / 959 / 2009 / 3095 mm
- Spindle bore : Ø181 mm
- Bar work dia. : Ø166.5 mm
- Spindle speed : 1500 r/min
- Sp. motor power : 37 kW (Gear-Box)
- Rotary tool power : 11 kW
- Tool setter clearance : 540 mm

Machine Models

- **PUMA 400 (A / B / C)**
- **PUMA 400L (A / B / C)**
- **PUMA 400XL (A / B / C)**
- **PUMA 400M (A / B / C)**
- **PUMA 400LM (A / B / C)**
- **PUMA 400XLM (A / B / C)**

  [Chuck Size : 12"(A) / 15"(B) / 21"(C)]

Features

- Medium & Large size High Performance model
- Rigid Box Guide Ways (Hardened & Ground)
- Powerful Spindle Drive
- Milling Head, BMT75P (Preci-Flex)
  - Face & Taper Dual Contact
  - ER Collet & PF-Adaptor Compatible
- Increased Rotary Tool Power (7.5 kW / 96Nm)
- Long Bed (P400L/LM), Extra Long Bed (P400XL/XLM)
- Big Spindle Bore (C type)
- Long Boring Bar Application (Option)

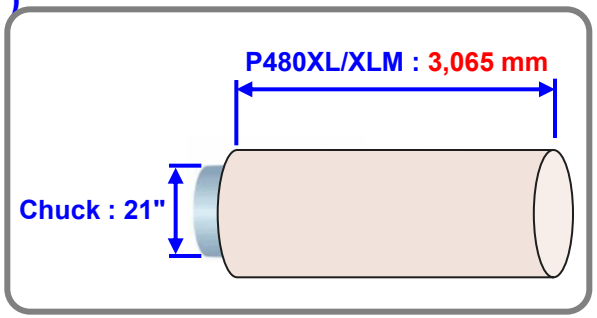
PUMA 480 series

Major spec. (P480 / L / XL)

- Swing over bed : 900 mm
- Swing over carriage : 720 mm
- Max. turning dia. : 650 mm
- Max. turning length : 992 / 2042 / 3065 mm
- **Sp. motor power : 45 kW (동급 최대)**
- Sp. motor torque : 4,033 Nm
- Sp. through hole : 181 mm (*D : 275 mm)

Machine Models

- **PUMA 480 (D*)**
- **PUMA 480L (D*)**
- **PUMA 480XL (D*)**
- **PUMA 480M**
- **PUMA 480LM**
- **PUMA 480XLM**



Features

- Chuck Size : 21" (Opt. : 24")
- Biggest machining capacity in its class
- Long boring bar application (Option)
- Various Chucking System (Option)
- Servo Steady Rest application (Option on XL/XLM)
- Sliding type Pendant Arm Operation Panel (XL/XLM)
- Powerful Spindle Drive
- Milling Head, BMT75P (Preci-Flex)
  - Face & Taper Dual Contact
  - ER Collet & PF-Adaptor Compatible
- Rotary Tool Power (11kW/140Nm)

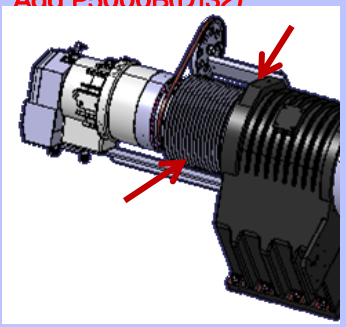
New PUMA 4000/5000 Concept

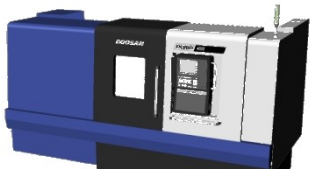
TOOLPOST

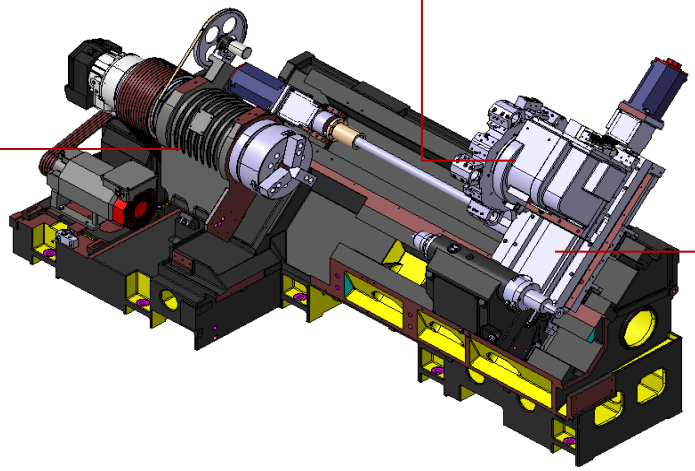
- Adapted New Milling Drive
  : Less Heat – Air & Oil Lub
  : Adapted Global Maker Bevel Gear

Headstock

- Simplify Pulley Structure
- Improve C aixs acuracy
- Enlarge P4000A Spindle Bore Φ102 → Φ115
- Add P5000B(D132)







Change Cover

- New DI
- New OP
- Pendant Arm → Sliding Door Type (P4000 Only)
- Twin Chucking Cover

Improve Electric Box Structure for easy Piping work

Saddle

- Improve Lubrication
- Ready for Linear Scale

[Upgrade] Oil & Gas Applications

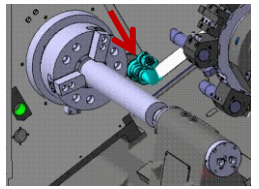
Twin Chucking

Thread Function

Long Boring Bar

Various Steady rest

Portable Q/S for Shaft



PUMA 4000/5000 Line up

Chuck	Group	Max. turn	Spindle bore	Bed	2-axis	M
12”	PUMA 400 18 model	Φ550	Φ102	L=1100	P400A	P400MA
				L=2200	P400LA	P400LMA
				L=3200	P400XLA	P400XLMA
15”			Φ132	L=1100	P400B	P400MB
				L=2200	P400LB	P400LMB
				L=3200	P400XLB	P400XLMB
21”			Φ181	L=1100	P400C	P400MC
				L=2200	P400LC	P400LMC
				L=3200	P400XLC	P400XLMC

P400 base

Chuck	Group	Max. turn	Spindle bore	Bed	2-axis	M
12”	PUMA 4000 18 model	Φ550	**Φ115**	L=1100	P4000A	P4000MA
				L=2200	P4000LA	P4000LMA
				L=3200	P400XLA	P400XLMA
15”			Φ132	L=1100	P4000B	P4000MB
				L=2200	P4000LB	P4000LMB
				L=3200	P400XLB	P400XLMB
21”			Φ181	L=1100	P4000C	P4000MC
				L=2200	P4000LC	P4000LMC
				L=3200	P400XLC	P400XLMC

- STD./LONG BED: P4000
- XL BED : Review After Development

Added model

Chuck	Group	Max. turn	Spindle bore	Bed	2-axis	M
15”	PUMA 5000 15 Model	Φ650	Φ132	L=1100	P5000B	P5000MB
				L=2200	P5000LB	P5000LMB
				L=3200	P480XLB	P480XLMB
21”			Φ181	L=1100	P5000C	P5000MC
				L=2200	P5000LC	P5000LMC
				L=3200	P480XLC	P480XLMC
no-chuck			Φ275	L=1100	P5000D	-
				L=2200	P5000LD	-
				L=3200	P480XLD	-

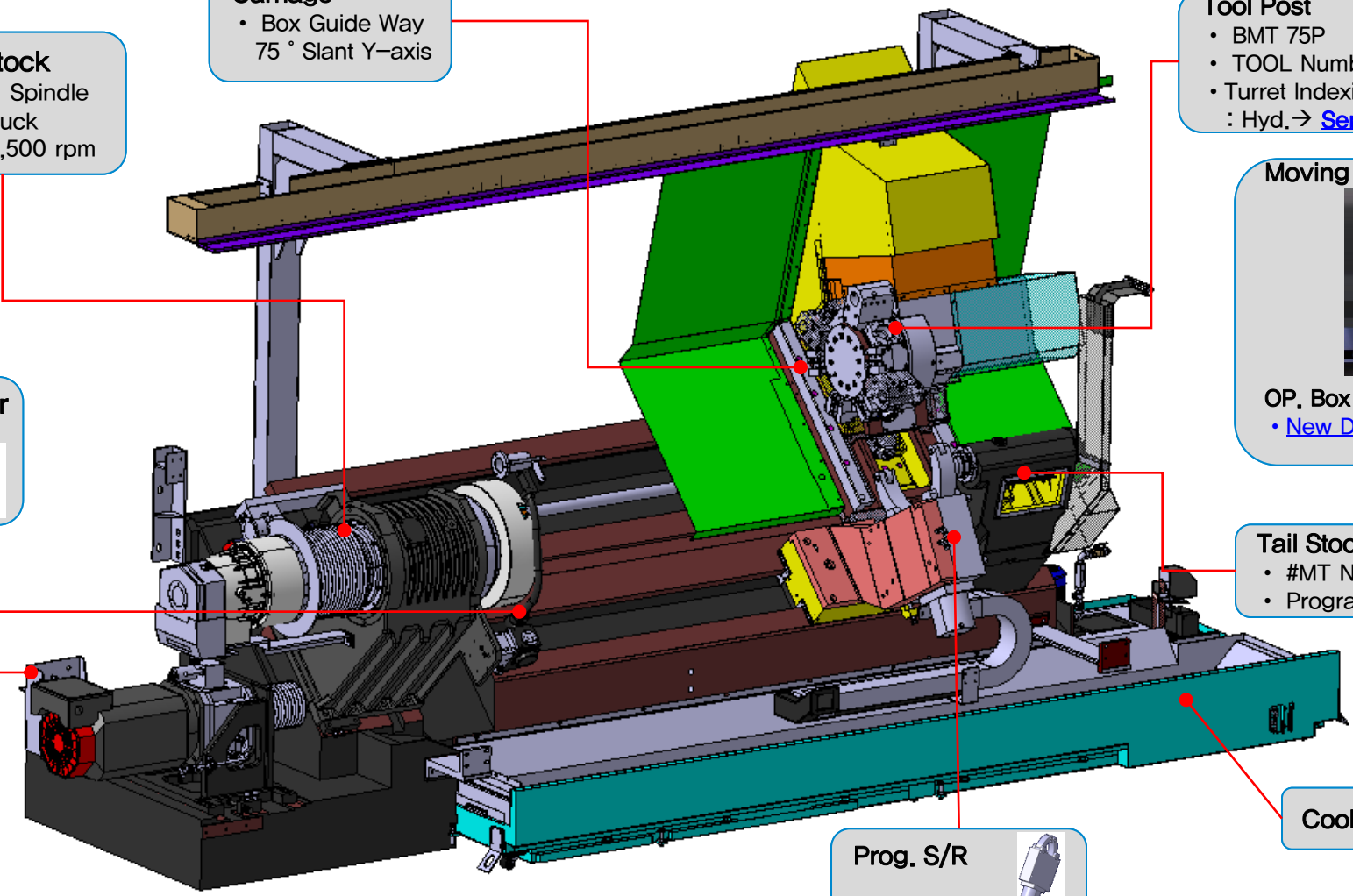
P480 base

Chuck	Group	Max. turn	Spindle bore	Bed	2-axis	M
21”	PUMA 480 9 model	Φ650	Φ181	L=1100	P480	P480M
				L=2200	P480L	P480LM
				L=3200	P480XL	P480XLM
no-chuck			Φ275	L=1100	P480D	-
				L=2200	P480LD	-
				L=3200	P480XLD	-

- Add 15” Model
- STD./LONG BED: P5000
- XL BED : Review After Development

New PUMA 5000LY_Launching Plan: ’14. 03 ~

Added Y axis to PUMA 480LM frame ➔ P5000LY



Carriage
- Box Guide Way
  75 ° Slant Y–axis

Head Stock
: P480LM Spindle
- 21” Chuck
- Max. 1,500 rpm

Tool Post
- BMT 75P
- TOOL Number 12EA
- Turret Indexing
  : Hyd.→ Servo

Moving Console

OP. Box
- New Doosan OP.

Tool Setter
: New Arm

Tail Stock Body
- #MT NO.5 (Live)
- Programmable Type

Lub . Unit

Coolant tank

Prog. S/R
- Slu5 (¢50~¢310)

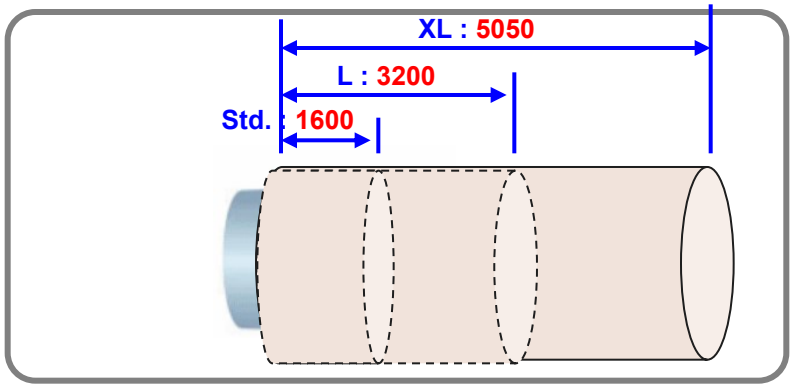
PUMA 600/700/800 series

Major spec.

- Swing over bed (2,M / Y) : 1030 / 1140 mm
- Swing over saddle (2,M / Y) : 800 / 1000 mm
- Max. turning dia. : 900 / 750 mm
- Max. turning length [Y] : 1600 / 3200[3250] / 5050 mm
- Spindle bore (600/700/800/B) : Ø152 / 181 / 320 / 375 mm
- Bar work dia.(600/700/800/B) : Ø117 / 164 / - / - mm
- Spindle speed (600/700/800/B) : 1800 /1500 / 750 / 550 r/min
- Sp. Motor power : 45 kW (G-Box)
- Rotary tool power : 11 kW

Machine Models

- **PUMA 600 / L / M / LM / LY / XLY**
- **PUMA 700 / L / M / LM / LY / XLY**
- **PUMA 800 / L / M / LM / LY / XLY / B / LB**



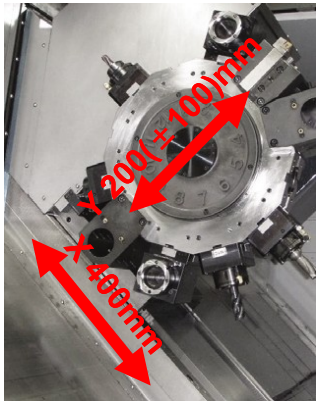
Features

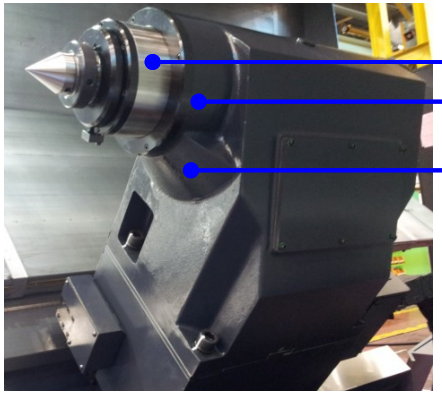
- Powerful Spindle Drive(3-step Gear box)
- Double Anchor Pre-tensioned Ball Screw (X, Z-axis)
- **Milling Head, BMT85P (Preci-Flex)**
  - Face & Taper Dual Contact
  - ER Collet & PF-Adaptor Compatible
- Maximized Rotary Tool Power : 11 kW
- **Extra Long Bed (L/XL)**
- **Extra Big Spindle Bore (800 type, 320 mm)**

PUMA 700LY Upgrade

Sales points…

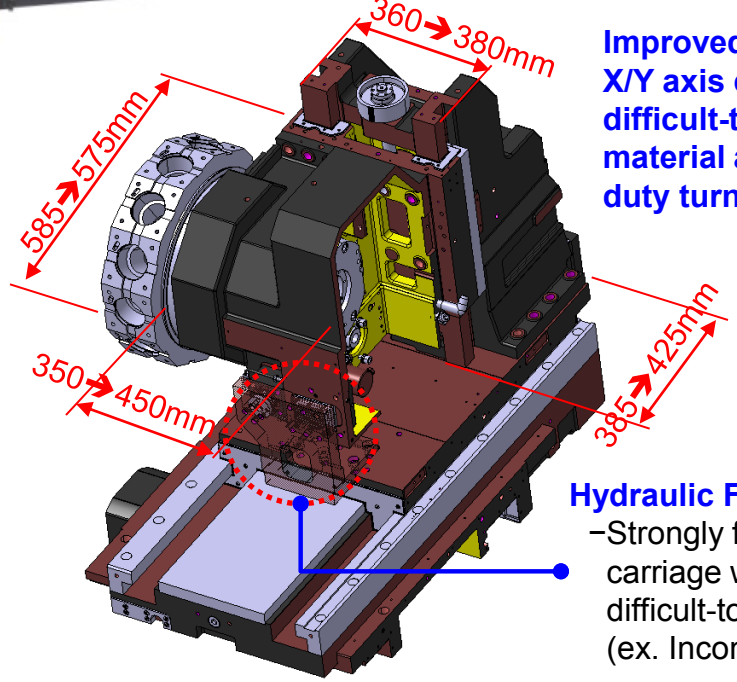
One machine & One set-up for Large size workpiece turning & machining with Orthogonal Y axis travel 200(±100)mm





Improved rigidity of Tail Stock to support heavy workpiece and heavy duty turning

- −Quill out diameter is changed from 160 to 180 mm
- −Body out diameter is changed from 210 to 240 mm
- −Added rib under front side



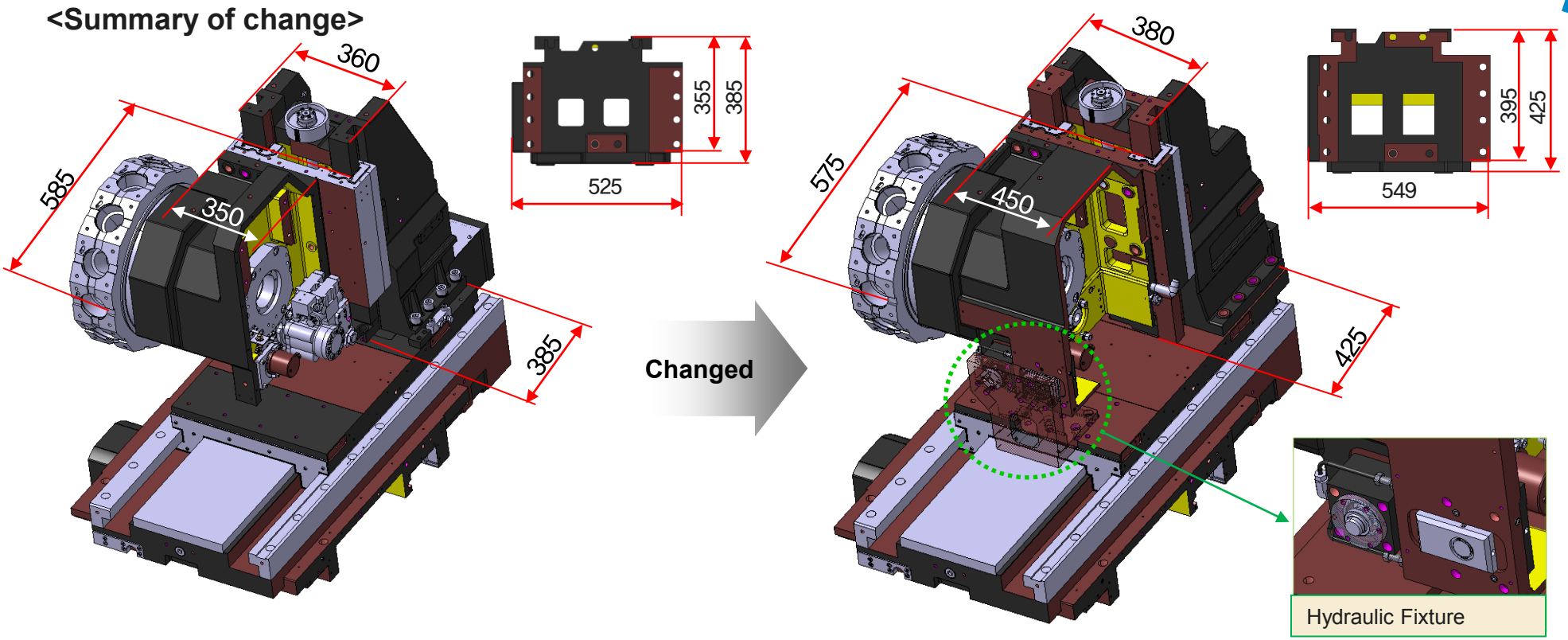
Improved rigidity of X/Y axis carriage for difficult-to-cut material and heavy duty turning

Hydraulic Fixture (Std.)

−Strongly fixing Y axis carriage when turning difficult-to-cut material (ex. Inconel) in Y 0 pos.

P700LY Series_ Carriage rigidity reinforcement

<Summary of change>



▣ Why :
- To improve the machining performance.
  (Specially hard cutting material)

▣ Modified :
- Change the shape of the Y-column / X-cross / Y-cross / tool post body.
- Add the hydraulic fixture.

▣ Machine : P600~P800 LY Series

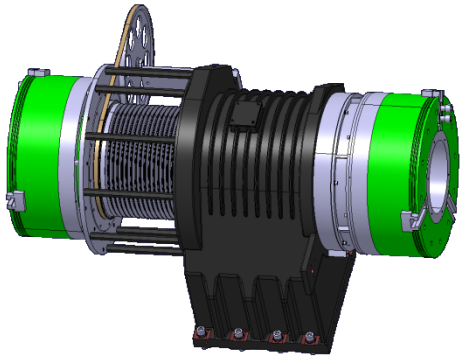
▣ Prod. Started : Sep. 2012

▣ **Field Retrofit: Available**

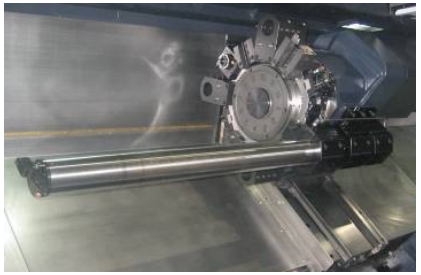
[Notice] Hyd. Fixture and Long boring bar application can not mounted simultaneously.

OIL & GAS _ APPLICATIONS

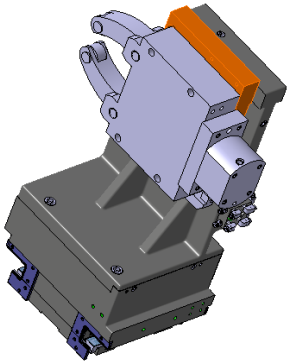
Twin Chucking



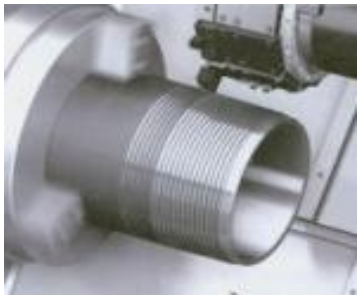
Long Boring Bar



Various Steady rest



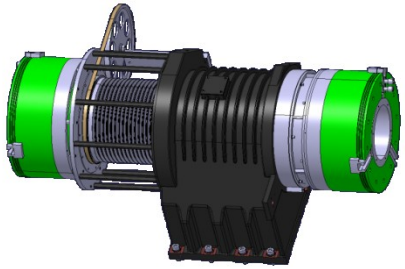
Thread Function



Also available function
to 2-axis Headstock with C-axis

OIL & GAS _ TWIN CHUCKING

Rear Chuck



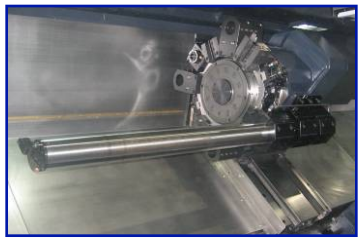
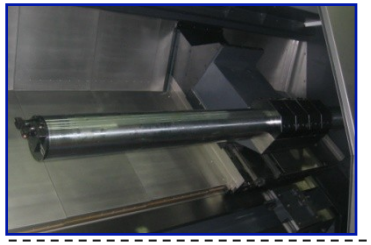
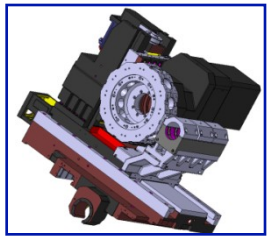
Front Chuck

[Note to order twin chucking]

1. Doosan supply chuck adapter and Air Unit fundamentally for preparation to be bought chuck by customer
2. Doosan can only attach Air or Manual chuck due to Structure that Hyd. Chuck, Cylinder can not be mounted

Machine	Type	Maker	Specification (OD - ID)	Front	Rear	Remark
Puma 400B	Pneumatic	SMW-AUTOBLOK	BB-N 400-140-3-Z310	◯	O	
Puma 400C	Pneumatic	SMW-AUTOBLOK	BB-N 500-205-3-Z415	◯	O	
	Pneumatic	SMW-AUTOBLOK	BB-N 470-191-3-Z310	◯	X	
	Pneumatic	KITAGAWA	UBR450K	◯	O	
Puma 480	Pneumatic	Schunk	ROTA TB 500-205	◯	X	
	Pneumatic	ROHM	ZGU-ZSU DIM6350-500	X	O	
	Manual	TdeG	D530-D181	◯	O	
	Manual	SAMCHULLY	FTC610	◯	O	
Puma 480D	Pneumatic	SMW-AUTOBLOK	BB-N 600-275	O	O	Stroke : 25mm or 12mm
		Schunk	TB 600-275	O	O	Stroke : 25mm or 12mm
	Manual	TdeG	630-280	O	O	Oil Country Concentric - 3&4 Jaws
			600-267	O	O	Oil country 4 Jaws Independent Chuck
Puma 800B	Pneumatic	SMW-AUTOBLOK	BB-N-ES 850-375	O	X	
			BB-AZ-ES 750-370	O	O	
		Schunk	ROTA TB-LH 850-375	O	X	
			ROTA TB 800-365	O	X	
	Manual	TdeG	800-381	O	O	Large Dia. Combination Chuck 800-381
			800-370	O	O	Oil Country 3 Jaws self centering

OIL & GAS _ LONG BORING BAR

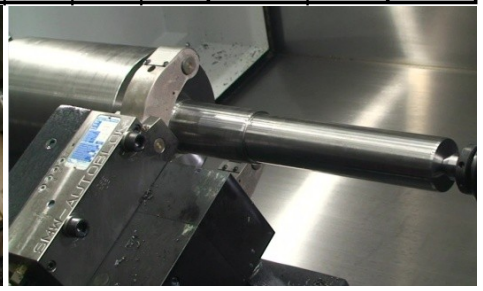
TYPE	Reference Picture	Notice	Application Model
Bolted to Turret		• Tool holders can not be mounted on just next stations of long boring holder due to interference. • Limitation of max. tool weight. • Adjust the indexing time after assembly for smooth indexing.	• D100 • Puma 600M / LM / XLM • Puma 700M / LM / XLM • Puma 800M / LM / XLM
Bolted to Turret & Tool-post Body		• Tool holders can not be mounted on just next stations of long boring holder due to interference. • Disassemble the front part mounted on Turret to use other tools.	• D60 • Puma 400/M/L/LM/XL/XLM • D80 • Puma 400M/LM/XLM • Puma 480M/LM/XLM • D100 • Puma 400/M/L/LM/XL/XLM • Puma 480/M/L/LM/XL/XLM/D/LD • Puma 600(700,800)/L/XL • D120 • Puma 600(700,800)M/LM/XLM • D150 • Puma 600(700,800)/L/XL
Substitute for Tool post		• Long boring holder is used instead of tool post. • Standard tooling is not available	• D200 • Puma 600/M/L/LM • Puma 700/M/L/LM • Puma 800/M/L/LM
Bolted to Turret & Cross slide		• Tool holders can not be mounted on just next stations of long boring holder due to interference. • Disassemble the whole long boring assembly to use other tools.	• D120 • Puma 600LY/XLY • Puma 700LY/XLY • Puma 800LY/XLY

OIL & GAS _ STEADY REST

STEADY REST

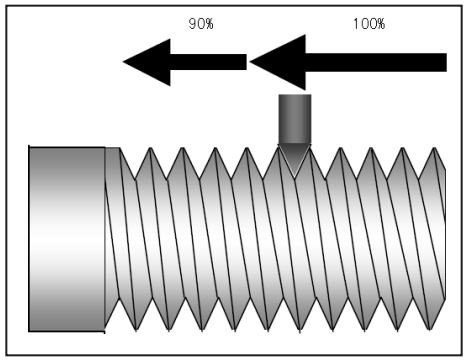
- CV : Design complete, delivery will be same with standard model
- SQ : Special Quotation, Delivery will be 1 or 2 month later than standard model

Machine		Steady Rest Application Specification																		
		SLU-1 Φ11 ~64	SLU-2 Φ16 ~101	SLU-3 Φ16 ~152	SLU-3.1 Φ20 ~165	SLU-3.2 Φ50 ~200	SLU-4 Φ30 ~245	SLU-5 Φ45 ~310	SLU-5.1 Φ85 ~350	SLU-6 Φ125 ~460	K-5 Φ80 ~390	K-5.1 Φ100 ~410	SLU-B3 Φ21 ~150	SLU-B3.1 Φ20 ~165	SLU-B3.2 Φ50 ~200	SLU-B4 Φ35 ~245	SLU-B5 Φ50 ~310	Manual	LZ50 -310 ATLING	Semi (Holder Type)
Medium Size	Puma 400A/B/C	X	X	CV	CV	X	CV	X	X	X	X	X	X	X	X	X	X	CV Φ25~200 Φ50~260	SQ	X
	Puma 400MA/MB/MC	X	X	CV	CV	X	CV	X	X	X	X	X	X	X	X	X	X		SQ	X
	Puma 400LA/LB/LC	X	X	CV	CV	X	CV	X	X	X	X	X	X	X	X	X	X		SQ	X
	Puma 400LMA/LMB/LMC	X	X	CV	CV	X	CV	X	X	X	X	X	X	X	X	X	X		SQ	X
	Puma 400 XLA/XLB/XLC	X	X	CV	CV	X	CV	X	X	X	X	X	X	X	X	X	X		SQ	X
	Puma 400XLMA/XLMB/XLMC	X	X	CV	CV	X	CV	X	X	X	X	X	X	X	X	X	X		SQ	X
	Puma 480/M	X	X	X	X	X	CV	CV	SQ	X	X	X	X	X	X	X	X	CV Φ50~260 Φ35~330	X	X
	Puma 480L/LM	X	X	X	X	X	CV	CV	SQ	X	X	X	X	X	X	X	X		X	X
	Puma 480XL/XLM	X	X	X	X	X	CV	CV	SQ	X	X	X	X	X	X	X	X		X	X
	Puma 480D/LD/XLD	X	X	X	X	X	CV	CV	SQ	X	X	X	X	X	X	X	X		X	X
Large Size	Puma 600/700/800	X	X	X	X	X	CV	CV	CV	X	X	X	X	X	X	X	X	CV Φ35~330 Φ300 ~450	X	X
	Puma 800B	X	X	X	X	X	CV	CV	CV	X	X	X	X	X	X	X	X		X	X
	Puma 600L/700L/800L	X	X	X	X	X	CV	CV	CV	X	X	X	X	X	X	X	X		X	X
	Puma 600XL/700XL/800XL	X	X	X	X	X	CV	CV	CV	X	X	X	X	X	X	X	X		X	X
	Puma 600M/700M/800M	X	X	X	X	X	CV	CV	CV	X	X	X	X	X	X	X	X		X	X
	Puma 600LM/700LM/800LM	X	X	X	X	X	CV	CV	CV	X	X	X	X	X	X	X	X		X	X
	Puma 600XLM/700XLM/800XLM	X	X	X	X	X	CV	CV	CV	X	X	X	X	X	X	X	X		X	X
	Puma 600LY/700LY/800LY	X	X	X	X	X	CV	CV	CV	X	SQ	SQ	X	X	X	X	X		X	X
	Puma 600XLY/700XLY/800XLY	X	X	X	X	X	CV	CV	CV	X	SQ	SQ	X	X	X	X	X		X	X



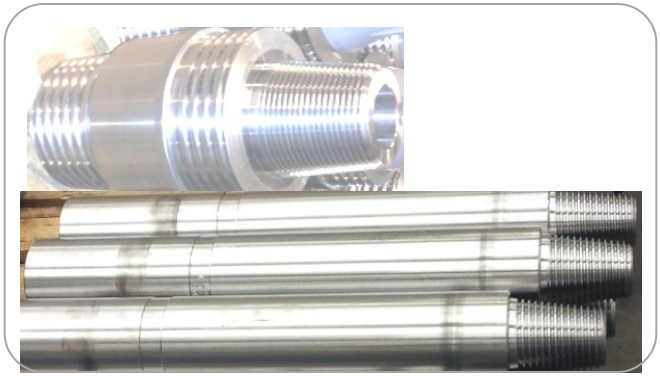
OIL & GAS _ THREAD FUNCTION

Arbitrary Speed Threading



0iTD	32i-A	32i-B	31i-A	31i-B
		✓	✓	

also available function
to 2-axis Headstock with C-axis

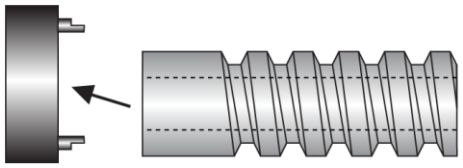


'Spindle speed override' when thread cutting

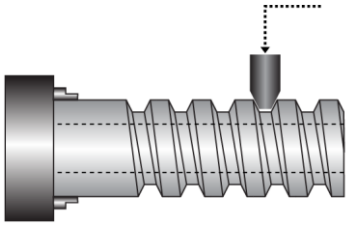
- Allowing the operator to adjust the spindle speed to avoid chatter
- CNC maintains feed axis synchronization to assure thread definition
- This function is useful restraining vibration & repeat machining that use various spindle speed

'Re-machining'

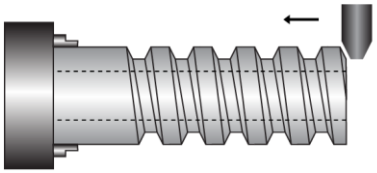
- Previously machined threads can be easily repaired



• Chucking the damaged part



• Manually positioning the tool into the machined thread with the spindle stopped
• Registering the position with the CNC the damaged part

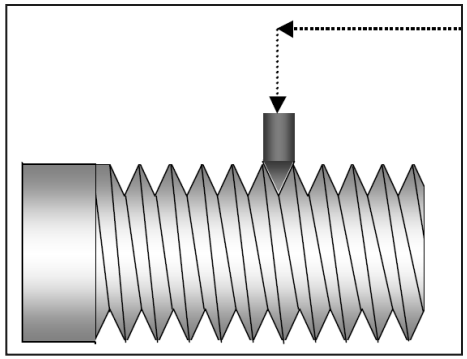


• Retract the tool, start the spindle and run the part program to re-machined the thread

OIL & GAS _ THREAD FUNCTION

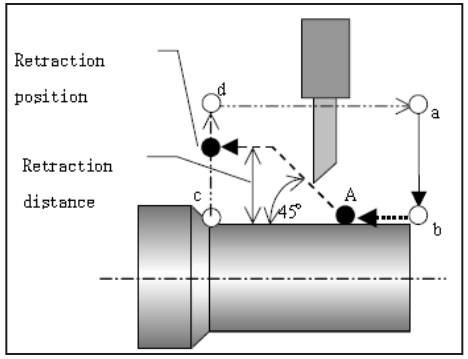
Efficient Thread Function

0iTD	32i-A	32i-B	31i-A	31i-B



- Thread repair function
  - –When the work-piece remove from chuck with any reason during thread cutting, this function allow that restart machining form same groove of thread before.
  - –After chucking measure the position of thread groove, then start machining by same program.
  - –MANUAL GUIDE i support the part of this function, advanced function is included “Arbitrary speed threading”
  - –This function need Cs contouring function

✓	✓	✓	✓	✓



- Tool retract and recover
  - –The tool can be retracted from a work-piece to replace the tool, if damaged during machining, or to check the status of machining. Then, the tool can be returned to restart machining efficiently.
  - –When the operator notice the crack of insert or any problem of machining, turn on the WITHDRAW switch on OP Panel . Then, the machining would be stopped & automatically move to tool changing position. After tool change, turn on the RECOVER switch that reactivate the program.

	✓	✓	✓	✓

PUMA 480 series

Spec. Comparison

Descriptions		DOOSAN P480l	MAZAK QTN450	MORI SL403C	OKUMA LB35 II
Swing over bed	mm	900	845	935	721
Max. turning dia.	mm	650	580	620	490
Max. turning length	mm	2042	2075	2068	2000
Spindle motor power	kW	45	30	30	30
Spindle through hole	mm	181	166	185	180
Chuck size	inch	21" ~ 24"		18	18
Guide way	-	Box way			

Descriptions		DOOSAN P400XLA / XLB / XLC	DOOSAN P480XL	MORI SL403C/2000	MAZAK QT NEXUS 450II-M
Swing over bed	mm	770	900	-	845
Max. turning dia.	mm	550	650	620	580
Max. turning length	mm	3,150	3,065	2,068	-
Travel Distance (X/Z)	mm	X : 362 Z : 3,150 / 3,114 / 3,095	362/ 3,100	345/ 2,195	310/ 3,170
Chuck size	inch	12"/15"/21"	21"	18" ~ 21"	-
Spindle through hole	mm	102 / 132 / 181	181	-	166
Floor Space (WxD)	mm	6,635 x 2,340	6,980 x 2,340	-	7059.7x2386

PUMA 600/700/800 series

Spec. Comparison

Descriptions		DOOSAN P600 / 700 / 800	MAZAK ST-60N	MORI SL-65A	MORI SL-75A
Swing over bed	mm	1030	915	890	910
Max. turning dia.	mm	900	730	820	880
Max. turning length	mm	1600 [3200]	2035	790	1530
Spindle motor power	kw	45/37	45	37	37
Spindle through hole	mm	152 / 181 / 320	180	105	105
Travel distance (X/Z)	mm	470 /1650 [3235]	645/2035	435/860	460/1550
No. of tool stations	-	12	15	12	12